

## REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claim 1 is currently being amended. Claims 17-25 are canceled without prejudice or disclaimer.

This amendment changes and deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-12 are now pending in this application.

Claim 1 has been amended to further clarify the present invention. Specifically, claim 1 has been amended to include the language “without dissolving the nuclear fuel materials.” Support for this amendment can be found in the specification at least on page 12, lines 12-23 and on page 10, lines 28-31 which make it clear that the nuclear fuel materials are not dissolved.

### **Rejections under 35 U.S.C. § 103**

Claims 1-7 and 17-23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,322,545 to Gilchrist (hereafter “Gilchrist”) in view of U.S. Patent No. 5,009,752 to Tomczuk et al. (hereafter “Tomczuk”). Claims 8 and 24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Gilchrist and Tomczuk and further in view of U.S. Patent No. 5,225,051 to Poa et al. (hereafter “Poa”). Claims 9-12 and 25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Gilchrist and Tomczuk and further in view of U.S. Patent No. 5,160,367 to Pierce et al. (hereafter “Pierce”). These rejections are moot with respect to claims 17-25, which have been cancelled. With respect to claims 1-12, applicants traverse these rejections for at least the following reasons.

Independent claim 1 is directed to a method of treating electrically conductive waste contaminated with nuclear fuel materials. Independent claim 1, as amended, recites a molten salt electrolysis process for removing the nuclear fuel materials adhering to a surface of the

waste by immersing the waste in a molten salt to dissolve a surface layer of the waste electrochemically in the molten salt without dissolving the nuclear fuel materials so as to provide a decontaminated electrically conductive waste. Thus in the present invention as recited in claim 1, the surface of the electrically conductive waste is dissolved whereas the nuclear fuel materials are not dissolved. Applicants submit that the references cited in the rejection fail to suggest the method as recited in claim 1.

The Office Action relies on Tomczuk and Gilchrist in rejecting claim 1. However, even if there were motivation (which there is not) to combine Tomczuk with Gilchrist, the resulting combination would not meet the limitations as recited in claim 1. Tomczuk is directed to recovery of fissionable materials from spent reactor fuel by anodic dissolution (see title), and discloses loading chopped, spent metal-clad fuel pins 20 in perforated metal screen boxes 17 of an anode basket (col. 5, lines 43-52). Tomczuk, however, does not disclose either that a surface layer of the pins 20 is dissolved, or that the nuclear fuel materials in the pins 20 are not dissolved. Thus, even if the Gilchrist method were modified to include the process using the fuel pins 20 and anode basket of Tomczuk the resultant method would still not include a molten salt electrolysis process for removing the nuclear fuel materials adhering to a surface of the waste by immersing the waste in a molten salt to dissolve a surface layer of the waste electrochemically in the molten salt without dissolving the nuclear fuel materials so as to provide a decontaminated electrically conductive waste as recited in claim 1.

Moreover, Tomczuk teaches away from the present invention of claim 1. First, Tomczuk suggests that the nuclear fuel materials of the spent fuel pins should be dissolved in order to recover fissionable materials. Thus, Tomczuk teaches away from a process where the nuclear fuel materials are not dissolved. Second, it would be expected in the process disclosed in Tomczuk that the metal cladding (which the Office Action equates with the waste of the claims), would not be dissolved during the process of the electrochemical separation of uranium and plutonium from the metal cladding. If the metal cladding were to be dissolved in the separation process, another process would likely be needed to follow in order to separate the metal from the electrolyte including the fuel materials. In this regard, Tomczak discloses “The voltage is preferably held below 1.25 volts (absolute value), and more preferably below 1 volt (absolute value)” (col. 5, lines 52-54). It would be expected, however, that 1.25 volts would be insufficient to dissolve the metal cladding material (steel) electrochemically. Thus, Tomczuk teaches away from a process where the metal

cladding (which the Office Action equates with the waste of the claims) is dissolved in contrast to claim 1.

Applicants again submit that one skilled in the art would not have combined Tomczuk with Gilchrist in the fashion suggested in the Office Action. Gilchrist discloses providing uranium chloride powder into the reactor vessel 13 through inlet line 19 (col. 2, lines 45-49). One skilled in the art would not have substituted the chopped spent metal-clad fuel pins of Tomczuk for the uranium chloride powder of Gilchrist, at least because of risk of increased contamination due to the metal cladding of the fuel pins. Gilchrist is directed to producing uranium per se, not in recovering uranium and plutonium from spent fuel pins as disclosed in Tomczuk. There would be no need to use spent fuel pins in the Gilchrist process, and the risk of contamination would have led one skilled in the art away from combining these references in the fashion suggested in the Office Action.

In response the Office Action states that “since Gilchrist suggests removal of impurities (i.e., unwanted materials), and Tomczuk teaches the removal of waste from nuclear materials, there is enough of a motivation to combine Tomczuk and Gilchrist.” Applicant’s respectfully disagree that there is motivation for such a combination. As mentioned above, the Gilchrist process provides uranium chloride powder into the reactor vessel in a method of producing uranium, not in a recovery process. The uranium chloride powder would be expected to have a much smaller degree of contamination than the spent fuel pins of Tomczuk. While of course the risk of contamination with the metal of the spent pins of Tomczuk would be necessary in the uranium and plutonium recovery process of Tomczuk, such a risk is not necessary in the Gilchrist process which is not directed to a recovery process. Thus, one skilled in the art would be led away from combining Tomczuk and Gilchrist in the fashion suggested in the Office Action because of the contamination risk.

Pierce and Poa also fail to cure the deficiencies of Tomczuk and Gilchrist. Poa was cited for allegedly disclosing the use of a liquid metal electrode in a process for reclaiming nuclear fuel materials. Pierce was cited for allegedly disclosing a reducing process for reducing oxide nuclear fuel materials to metals. Pierce and Poa, however, also fail to suggest that decontaminated electrically conductive waste is provided by using molten salt electrolysis to remove nuclear fuel materials adhering to a surface of the contaminated waste to dissolve a surface layer of the waste without dissolving the nuclear fuel materials

electrochemically in the molten salt.

For at least the reasons given above, applicants submit that claim 1 is patentable over Tomczuk, Gilchrist, Poa and Pierce, and request that the rejections under 35 U.S.C. 103 be withdrawn. The dependent claims are patentable for at least the same reasons as claim 1, as well as for further patentable features recited therein.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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